CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER 98-054
NPDES PERMIT NO. CA0037834
REISSUING WASTE DISCHARGE REQUIREMENTS FOR:

CITY OF PALO ALTO
PALO ALTO REGIONAL WATER QUALITY CONTROL PLANT
PALO ALTO
SANTA CLARA COUNTY

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The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Regional Board) finds that:

1. The City of Palo Alto (hereinafter the Discharger) submitted a National Pollutant Discharge Elimination System (NPDES) permit application for reissuance and amendment of waste discharge requirements under NPDES Permit No. CA0037834.

2. In 1997 the Discharger discharged an average dry weather flow of approximately 24 million gallons per day (mgd) from its advanced waste treatment facility at 2501 Embarcadero Way, Palo Alto. The Discharger supplies reclaimed water (unrestricted use) at its facility. Treatment facilities consist of screening, primary treatment, fixed-film roughing filters for CBOD reduction, activated sludge for nitrification, secondary clarification, dual media filtration, chlorination, and dechlorination. Sludge is gravity thickened, dewatered using belt presses, and incinerated in multiple hearth furnaces. A plant expansion was completed in 1988, increasing the average dry weather flow capacity to 39 mgd. The facility treats wastewater from Palo Alto, Mountain View, Los Altos, Los Altos Hills, Stanford University, and the East Palo Alto Sanitary District.

3. NPDES Permits have been issued to each of the three publicly owned treatment works ("POTWs") discharging into the South Bay, namely the San Jose/Santa Clara Water Pollution Control Plant (CA 0037842), the Palo Alto Regional Water Quality Control Plant (CA0037834), and the Sunnyvale Water Pollution Control Plant (CA0037621). The current NPDES Permits for the three South Bay POTWs (the "1993 Permits") were adopted by the Regional Board in July 1993 (in the case of the Sunnyvale and Palo Alto Plants) and October 1993 (in the case of San Jose/Santa Clara Plant). The terms of the Cease and Desist Orders (CDOs) which accompany the 1993 Permits (the "1993 CDOs"), are co-extensive with the terms of the 1993 Permits. The 1993 Permits and 1993 CDOs are subject to the State Board's court-ordered remand order (State Water Board Order No. 94-

8). Pending issuance of new permits, the three Cities' have committed to the Regional Board to abide by the terms of the 1993 Permits and 1993 CDOs.

Certain information relative to the lengthy regulatory history of the 1993 Permit is contained in Appendix A to this Order.

4. **Clean Water Act Section 304(l) Listing**. Section 304(l) of the federal Clean Water Act (as amended in 1987) required States to develop lists of water bodies impaired by toxic pollutant discharges, identify point sources and pollutants causing toxic impacts, and develop individual control strategies (ICSs) for each point source identified. In February 1989, the State Water Resources Control Board (State Board) designated the Lower South San Francisco Bay as an impaired water body under Section 304(l), due to evidence of water quality impacts associated with seven metals based on total recoverable fractions: cadmium, copper, lead, mercury, nickel, selenium, and silver. The State Board identified the three municipal plants and storm water discharges into the Lower South Bay as point sources contributing to this impairment. In June 1989, EPA Region IX approved the State's inclusion of the Lower South Bay and conditionally approved the three NPDES permits as ICSs for the municipal discharges.

Metals concentrations in the three municipal discharges have been declining since the original South Bay 304(l) listing. Recent Regional Monitoring Program (RMP) monitoring of South Bay waters demonstrates that objectives for most metals are met. Only three metals show intermittent exceedances compared to the total recoverable water quality objectives in the 1993 Permit: copper (4.9 ug/l), nickel (8.3 μg/l), and the human health objective for mercury (0.025 μg/l).

Watershed Management Initiative

5. This Order was developed in cooperation with the Santa Clara Basin Watershed Management Initiative (WMI). The WMI, in which the Discharger is an active participant, is a stakeholder driven process that commenced in June 1996 as a pilot effort by the Regional Board. The Initiative seeks to integrate regulatory and watershed programs in the South San Francisco Bay Region. This Order is consistent with the approach developed by the Regulatory Subgroup of the WMI to include interim permit limits in the three South Bay POTW NPDES permits and a process to establish final limits. The Discharger is committed to encouraging stakeholder input with regard to permit requirements and programs. In cooperation with the Bay Monitoring and Modeling Subgroup of the WMI, the Discharger is participating in technical studies and analyses that are needed by the Regional Board to develop site-specific water quality objectives, and a Total Maximum Daily Load (TMDL) calculation for copper and nickel for the South San Francisco Bay. If any WMI stakeholder believes that the technical studies are not proceeding in a manner that will lead to the development of site specific water quality objectives by July 2003, they may petition the Regional Board to reopen this permit. The Regional Board will involve the TMDL peer review group and/or other appropriate WMI subgroup as part of investigating the merits of the petition.

As defined by US EPA, the TMDL process provides a flexible assessment and planning framework for identifying load reductions or other actions needed to attain water quality standards. Clean Water Act (Section 303(d) established the TMDL process to guide application of state standards to individual waterbodies/watersheds. The WMI's TMDL Process is consistent with the US EPA approach.

Basin Plan Beneficial Uses

6. The Regional Board adopted a revised Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) on June 21, 1995. This updated and consolidated Plan represents

the Board's master water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board (State Board) and the Office of Administrative Law on July 20, 1995, and November 13, 1995, respectively. A summary of regulatory provisions is contained in Title 23 of the California Code of Regulations at Section 3912. The Basin Plan defines beneficial uses and water quality objectives for waters of the state in the Region, including surface waters and groundwaters.

7. The beneficial uses of San Francisco Bay, South Bay (south of the Dumbarton Bridge) and contiguous water bodies are defined in the Basin Plan to be:

Water contact recreation
Non-contact water recreation
Wildlife habitat
Preservation of rare and endangered species
Estuarine habitat
Fish migration
Fish spawning (potential use)
Industrial service supply
Shellfish harvesting
Navigation
Commercial and sport fishing

8. Treated wastewater from the treatment plant flows into a man made channel (37 deg. 27 min 11 sec latitude – 122 deg. 06 min 36 sec longitude) and on to San Francisco Bay, both of which constitute salt water environments.

Water Quality Objectives

9. In order to protect beneficial uses, the Basin Plan (page 3-4) sets a narrative objective of: "All waters shall be maintained free of toxic substances in concentrations that are lethal to or produce other detrimental responses in aquatic organisms." Effluent limitations and provisions contained in this Order are designed to implement this objective, based on available information. The Basin Plan (page 3-5) also states that for the South Bay below the Dumbarton Bridge, water quality objectives contained in the Basin Plan should be considered guidance only. The Basin Plan notes that site specific objectives are absolutely necessary for this area. It directs that ambient conditions shall be maintained until site specific objectives are developed. Further, the Basin Plan (page 4-8) provides that alternate effluent limitations can be considered by the Board where a site specific water quality objective is being proposed and the Discharger is participating in a source control program.

Copper Water Quality Objective

10. For purposes of this permit the Basin Plan narrative water quality objectives will be interpreted as follows for copper:

EPA Guidance. On October 1, 1993, in recognition that the dissolved fraction is a better representation of the biologically active portion of the metal than the total or total recoverable fraction, EPA's Office of Water issued guidance stating that dissolved metal concentrations should be used for the application of metals aquatic life criteria and that state water quality standards for the protection of aquatic life (with the exception of chronic mercury criterion) be based on dissolved metals. EPA amended the National Toxics Rule (NTR) in 1995 to include factors to convert total metals to dissolved metals for both fresh and salt water objectives. The August 1997 proposed California Toxics Rule (CTR) water quality criteria for metals are expressed as dissolved. Since effluent limits must be expressed as total recoverable metals, use of the NTR/CTR objectives would require translation from dissolved to total recoverable metals. The June 1996 EPA guidance

document entitled *The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion* describes this process.

Translator Study. The City of Sunnyvale submitted results of a dissolved to total recoverable metals translator study it conducted based on EPA's June 1996 guidance document in December 1997. Using RMP data and data from prior South Bay site specific objective studies, the Discharger calculated a translator value of 0.62 for copper in the main water mass of the Lower South Bay. Using the methodology employed by US EPA in the proposed Economic Impact Assessment which appeared concurrently with the proposed CTR the proposed CTR value for copper (3.1 µg/L dissolved) could be translated to 5.0 µg/ (total).

San Jose Updated Copper WER Study. The City of San Jose conducted extensive studies to develop water effects ratios (WER) for copper for the South Bay. Results were submitted to US EPA in September 1997 as part of comments on the proposed CTR. Revised WERs in the South Bay for the period January 1996 through March 1997 ranged from 2.17 to 4.86 for dissolved copper and 2.10 to 8.75 for total copper. The Board has also developed a Bay wide site specific objective for copper (subsequently remanded by the State Board) based on a bay-wide WER of 1.7. The Board is not using the 1.7 WER for this permit since it is a Bay wide number based on limited data, whereas the South Bay study by San Jose is site specific and is based on more extensive and more recent data.

South Bay Site Specific Objective: Using a conservative approach and not considering translator values and using a 2.9 ug/l for total copper baseline, the WERs could range from a low of 2.10 to 8.75 for total copper. Utilizing a WER of 2.10 and a total copper of 2.9 µg/L yields a total recoverable metal final objective of 6.1 µg/L, while using a WER of 8.75 results in a final objective of 25.4 µg/L. These values comprise a wide range of objectives that are scientifically defensible and should be considered when adopting the final site-specific objective for copper in the South Bay.

Permit Limits. The Board recognizes that the information used to develop the range of objectives may change during the life of the permit and that the objective will be revised prior to the next permit re-issuance, based on studies required by this permit and other studies. The current long term average copper concentrations in the Discharger's effluent (1996 and 1997 average copper concentration for San Jose 4.2 ug/l, Sunnyvale 4.1 ug/l, Palo Alto 5.7 ug/l) meet and exceed the most conservative end of the range of the available scientific data for final water quality objectives. Therefore, permit limits in this Order are established to assure that current plant performance is maintained during the life of the permit and are protective of water quality, and these limits will assure that the narrative standards and beneficial uses described in the Basin Plan are achieved.

When the Regional Board considers Site Specific Objectives for the South Bay it will consider all studies done to date, including the 4.9 ug/l value, and the studies to be done as required by this permit.

11. 40 CFR 122.44(d)(1)(I) requires the permit to include limits for all pollutants "which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any State water quality standard." The Discharger conducted, and the Regional Board reviewed and approved, an analysis of effluent data to determine if the discharges had reasonable potential to cause or contribute to an exceedance of a State water quality standard ("RP analysis"). The RP analysis conservatively assumed that the effluent would receive no dilution.

12. **Reasonable Potential Analysis**: Using the method described in the Proposed Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries in California (Draft, September 1997), and US EPA guidance documents, the

Discharger has performed a Reasonable Potential Analysis. Effluent limitations were included in this Order only if a reasonable potential exists to cause, or contribute to an excursion above any applicable priority pollutant criterion or objective.

Review of the 1995-1997 data showed that the only toxic constituents present in the Dischargers effluent at concentrations greater than the detection limit were arsenic, selenium, copper, mercury, nickel, silver, zinc, tributyl tin, cyanide, and several organic compounds. Of those constituents, only copper, cyanide, selenium and tributyl tin had reasonable potential to exceed federal water quality criteria in the future. Based on this analysis, numeric limits are required to be included in the permit for copper, cyanide, selenium, and tributyl tin. All of the other toxic constituents with limits above the detection limit were found at levels well below the corresponding effluent limitations. Based on continued consistent plant performance none of these constituents show a reasonable potential to federal water quality criteria. Under the federal Clean Water Act and the State Water Code, constituents of this nature are controlled by the requirement for secondary treatment.

13. **Uncertainty as to Reasonable Potential to Cause Exceedance of Objectives.**

It is not possible at this time to determine whether the Discharger's copper discharge is causing an exceedance in the water quality criteria for copper for the receiving waters, and thus there is corresponding uncertainty as to whether further controls on the Discharger's copper effluent should be imposed. However, the studies and analyses required or contemplated by this Order will make it possible to make such determination during the term of this Order.

Copper discharged by the three Lower South Bay POTWs is only one of many sources of copper found in that water body. Other sources include: copper transported by tidal action from other parts of San Francisco Bay, historic deposits of copper in sediment which are gradually reintrained into the water column, nonpoint source discharges, stormwater runoff, and deposition of airborne copper. A principal feature of the studies to be conducted under the WMI will be to quantify the contributions from each source.

14. For all parameters that have reasonable potential for contributing to an exceedance of a numeric criteria, effluent limitations are established. For copper, the effluent limitation is based on current performance of the treatment plant. This limit is based on the need to protect water quality. There have been no observable toxicity events in the South Bay south of the Dumbarton Bridge attributed to copper levels and the limit is intended to ensure that ambient conditions in the South Bay will be maintained. For other parameters with a reasonable potential, US EPA water quality criteria, and the Basin Plan objective for tributyltin, are used to set effluent limits. The 99.7th percentile of the effluent data collected during the period 1995 through 1997 was chosen as the maximum daily limit for copper.

Basin Plan Discharge Prohibitions and Exceptions

15. The Basin Plan prohibits discharges receiving less than 10:1 minimum initial dilution via a deep water diffuser, discharges to dead-end sloughs, and discharges south of the Dumbarton Bridge. Therefore, the existing discharge location is contrary to Basin Plan policy.

16. Exceptions to the three Basin Plan prohibitions may be considered where the Discharger can show (1) a net environmental benefit as a result of the discharge, (2) that the project is part of a reclamation project, or (3) that the discharge will provide equivalent protection.

17. **Plant Reliability.** The Basin Plan further states (at page 4-5) that:

" In reviewing requests for exceptions, the Regional Board will consider the reliability of the Discharger's system in preventing inadequately treated wastewater from being discharged to the receiving water and the environmental consequences of such discharges."

The Discharger completed a plant reliability analysis in 1988 that demonstrated a high level of reliability. No significant changes have occurred at the plant, which would warrant an update of the 1988 reliability analysis. The discharge has demonstrated excellent reliability during the past 10 years. Average BOD has been 2.1 mg/l with the maximum being 4.4 mg/l. Suspended Solids average has been 2.2 mg/l with the maximum being 7.1 mg/l. There has not been any instance of inadequately treated wastewater discharged to the receiving water, with respect to conventional pollutants.

The plant has not had any significant process changes since August 1988 when, the plant expansion was completed and the two new clarifiers were placed into service. The plant reliability/stress test conducted in August 1988 certified the dry weather treatment capacity to be 39.0 MGD; the average equivalent flow for the test was actually 46 MGD. The plant peak wet weather capacity is rated at 80 MGD. On February 3, 1998 the plant operated at this rated capacity for 8 to 10 hours and discharged fully treated wastewater, the 24-hour composite sample had Suspended Solids of 15 mg/l and BOD of 5.4 mg/l as compared to daily maximum permit limits of 20 mg/l SS and 20 mg/l BOD There is no need for additional stress testing that could reduce the quality of the effluent and discharge added metals into the Bay during the test period.

18. The 1986 Basin Plan (at page III-5) did not include numeric water quality objectives for San Francisco Bay south of the Dumbarton Bridge. The Basin Plan found that the South Bay had a unique hydrogeologic environment, and that site-specific water quality objectives for metals were appropriate for the water body. The NPDES permit amendments issued to the Discharger on December 21, 1988 (Order 88-176) contained requirements for studies to assess impacts from metals on the water body, to investigate controls on metals levels discharged in effluent, and to develop water quality objectives based on cost/impact. Based on those studies the Discharger was allowed to propose water quality objectives based on toxicity testing. In connection with the issuance amendments to the Dischargers NPDES permit on December 21, 1988, the Regional Board granted a conditional exception to the discharge prohibitions. The conditions to the granted exceptions related to unresolved concerns regarding the potential impacts of heavy metals on the South Bay.

19. **State Board Order WQ 90-5**. In Order No. WQ 90-5, the State Board found that the evidence in the record did not support a finding that the discharge provided a net environmental benefit. Order WQ 90-5 did state that a finding of equivalent level of protection could be made if water quality based concentration limits for metals and revised mass loading limits for metals were placed in the permit.

WQ 90-5 found that water quality objectives were needed for the South Bay, and directed the Board to adopt objectives by March, 1991, and to amend the permit to include water quality based metals limits by April, 1991. In addition, the Board was required to modify the mass loading limits for metals in the permit. On April 17, 1991, Order 91-067 was adopted by the Board, which included revised concentration and mass loading limits for metals. Order 91-067 amended Finding 13 in the December 21, 1988 permit so as to state that: The requirements in this order support a finding of equivalent protection. The Board continued the granting of the exception in the NPDES permit issued to the Discharger on July 21, 1993.

20. **Prohibition Exceptions Continued**. This Order contains effluent limitations which are derived, for the most part, from effluent limitations contained in the Dischargers July 21, 1993 NPDES permit. Accordingly, they are substantially equivalent to the water quality based effluent limitations contained in that permit. The water quality based effluent

limits in this permit are subject to reevaluation when water quality criteria are adopted for lower South San Francisco Bay. Currently no such criteria have been adopted. Furthermore, the Discharger has implemented a reclamation program, in compliance with another discharge prohibition exception criterion. Therefore, the Discharger is granted a continued exception to the Basin Plan prohibitions based on a finding of equivalent level of environmental protection and implementation of a reclamation program.

Basis for Effluent Limits

21. **Performance-Based Copper Effluent Limit.** If the Board were to impose an effluent limitation for copper in this Order which was the same as the criteria contained in the National Toxics Rule, the Discharger would be unable to consistently comply with such an effluent limitation. In view of the considerations discussed above (i.e. Basin Plan direction, uncertainty in the Reasonable Potential Analysis, and toxicity monitoring), this Order contains a performance-based effluent limitation for that constituent. Unless the permit is reopened, the Discharger shall be required to achieve a performance-based effluent limitation for total recoverable copper of 12 ug/L, one-day average. This effluent limitation is more stringent than the interim effluent limitation for copper (17 ug/L) in the 1993 CDO and is based upon the Discharger's performance from 1995 through 1997. The limitation represents the 99.7th percentile of plant performance.

    It is the intent of the Regional Board to include revised water quality-based effluent limitations as enforceable limits by July 1, 2003. These revised water quality-based effluent limitations will be based on data developed by the Discharger, with the site-specific objectives and Total Maximum Daily Load (TMDL) studies. The technical studies and analysis to develop water quality based effluent limitations are anticipated to take 3 to 5 years. If the studies do not produce the required data the Board will base revised water quality based effluent limits on applicable State or federal water quality criteria available at that time. If neither site specific objectives nor water quality criteria are available, the Regional Board will set a revised performance-based effluent limit for copper based on the 95th percentile of plant performance between 1995 and 1997, i.e. 8.2 ug/l for copper, one-day average.

22. This Order also includes effluent limits for pollutants listed in the latest 303(d) report as impairing the quality of waters due, in part, to municipal point source discharges. For the South Bay the high priority pollutants are copper, nickel, and mercury which are therefore included in this Order.

23. **Limits for other constituents.** For the other toxic constituents for which this order has effluent limits, i.e. mercury, nickel, selenium and tributyl tin, limits are based on the 1995 Basin Plan and US EPA water quality criteria for mercury, nickel and selenium. For tributyl tin the limit is based on the 1995 Basin Plan.

24. **Mass Limits.** State Board Order No. WQ 90-5 stated on page 67; "These performance based (mass) limits will remain in effect until maximum daily loads and wasteload allocations are developed for the pollutants." The mass limits in this Order are consistent with direction from State Board Order No. WQ 90-5.

25. **Numeric Effluent Goals for Certain Additional Constituents.** Sixteen other constituents (or classes of constituents - PAHs, DDTs, Endosulfan) were not detected in the effluent using standard sampling and analytical procedures, but the available detection limits were above the effluent limitations specified in 1993 Permit Section B.4. Therefore an accurate estimation of reasonable potential to exceed the permit limitation is not possible for those constituents. Those constituents include: PAHs, hexachlorobenzene, aldrin, a-BHC, b-BHC, g-BHC, chlordane, DDT, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, toxaphene, PCBs, and 2,3,7,8 TCDD. This Order includes numeric

effluent goals (not effluent limitations) for toxic constituents for which historical effluent limitations are lower than current analytical techniques can measure. The Discharger will continue to monitor for constituents expressed as goals and to investigate methodologies to improve detection limits. When the new analytical techniques are approved for general use by Dischargers, a new reasonable potential analysis would be conducted to determine whether there is a need to add effluent limits to the permit or to continue monitoring.

26. **Monitoring Requirements for Certain Constituents.** For constituents that do not show a reasonable potential to exceed effluent limitations, i.e. cadmium, chromium, lead, silver, zinc, chloroform, halomethanes, and phenol, this Order requires continued monitoring and an annual evaluation. If significant increases in the concentrations of the constituents are observed, the Discharger will be required to investigate the source of the increases and establish remedial measures if the increases pose a threat to water quality. A reopener provision is included in this Order that allows numeric limits to be added to this Order for any constituent that in the future exhibits reasonable potential to cause or contribute to an exceedance of a water quality standard. This determination will be made by the Regional Board based on monitoring results.

27. **Use of TMDL and WLA/LA Analyses for Future Permit Decisions.** Additional studies to support the TMDL will evaluate the relative merits of all potential strategies to abate sources of copper, including the effects of natural attenuation of historic sedimentary deposits. In the meantime, given the low levels of copper in the Discharger's effluent (averaging 6.4 ug/l in 1997), it is not possible to determine with finality whether it is necessary to reduce the Discharger's copper discharge further in order to meet water quality objectives in the Lower South Bay, or whether, even if it is necessary at this time, the necessity would dissipate over a reasonable time in the future (e.g. though natural attenuation of sedimentary deposits). Once the special studies required for the TMDL and the WLA/LA have been completed, the Board can make its final determinations as to a water quality-based effluent limitation for copper. At that time, the Board can also determine what an appropriate water effects ratio should be for the Lower South Bay as well as the effect of an appropriate translator in developing any future water quality-based effluent limitation.

28. For the following reasons, the Regional Board believes that these limitations will protect all beneficial uses described in the Basin Plan:

Development of Site Specific Objectives and a Total Maximum Daily Load (TMDL). During the life of the permit, site-specific objectives (SSO) for copper and nickel will be developed. The permit requires the Discharger to participate in special studies which are needed by the Regional Board to develop site-specific objectives, and a TMDL calculation for copper and nickel. A description and schedule of the studies are listed in Provision 5. Once these studies are completed, the Regional Board will adopt SSOs and perform another reasonable potential analysis using the study results. Should the discharges exhibit "reasonable potential" to exceed the new SSOs, the next NPDES permit (scheduled for issuance in 2003) will contain numeric effluent limitations designed to meet these new SSOs. If new SSOs are not adopted, applicable state or federal criteria will be used. Also, should data collected during this permit indicate that the copper and/or nickel in the effluent is causing an exceedance of the narrative objectives, the Regional Board can reopen the permit in order to establish more restrictive numeric limitations for these parameters.

Narrative toxicity objective being met. The narrative toxicity objective is currently being met in the South Bay. Results of routine aquatic bioassays conducted in the South Bay by the Regional Monitoring Program in 1995 and 1996 (the most recent data) do not indicate toxicity (a 1996 special study by the RMP did find some toxicity due to stormwater discharges, not due to the Discharger's treatment plant). Furthermore, acute and chronic

Whole Effluent Toxicity (WET) testing has exhibited no toxicity in the effluent attributable to either copper or nickel, and future acute and chronic monitoring is required on a monthly basis. Should future RMP data, or WET testing (and follow-up TIE) indicate that copper and/or nickel are contributing to toxicity, this permit may be reopened to set more restrictive effluent limitations.

29. The approach the Regional Board has used to establish all of these water quality based effluent limitations is consistent with EPA guidance which states: In the absence of State numeric water quality objectives, the permit writer must rely on available information to identify the receiving water body beneficial uses and the ambient water quality, including numeric protective levels, necessary to attain such uses. Available information includes State water quality plans and/or available documentation supporting the applicability of objectives, technical literature, and federal numeric ambient water quality criteria. (EPA Region IX Guidance for NPDES Permit Issuance, February 1994).

30. **TMDL for Copper and Nickel.** Section 304(l) of the federal Clean Water Act (as amended in 1987) required States to develop lists of water bodies impaired by toxic pollutant discharges, identify point sources and pollutants causing toxic impacts, and develop individual control strategies (ICSs) for each point source identified. Section 303(d) of the Clean Water Act requires States every two years to list water bodies that do not meet or are not expected to meet water quality objectives after existing controls are implemented. On March 9, 1998, the Regional Board submitted the Section 303(d) List of Impaired Water Bodies and Priorities for Total Maximum Daily Loads (TMDLs) for the San Francisco Bay Region to the State Water Resources Control Board. The list includes a high priority ranking for copper and nickel in the Lower South Bay. Municipal sources were listed as a source for these two pollutants and development of TMDLs for these pollutants is scheduled to begin in 1998.

31. As defined by US EPA, the TMDL process provides a flexible assessment and planning framework for identifying load reductions or other actions needed to develop (if necessary) and attain water quality standards. Clean Water Act section 303(d) established the TMDL process to guide application of state standards to individual waterbodies and watersheds. The Discharger has volunteered resources to develop technical information that can be used by the State to develop site-specific objectives for copper and nickel in support of the TMDL process.

32. The Basin Plan, Shallow Water Discharges section (p. 4-12) specifies the issues that must be addressed to support requests for dilution credit. Shallow water Dischargers may apply to the Regional Board for exceptions to the assigned dilution ratio of D=0 (and thus the shallow water effluent limitations) based on demonstration of compliance with water quality objectives in the receiving waters and implementation of an aggressive pretreatment and source control program. Based on scientific studies submitted by the Discharger in January 1998, the Discharger has applied for a limited dilution credit. The dilution credit application has not been considered by the Regional Board and will be considered in the future.

Other Discharge Characteristics and Permit Conditions

33. The Discharger completed the chronic toxicity testing requirements of the effluent characterization program. The results of that work show chronic toxicity associated with the effluent. Specifically, the Discharger conducted a Toxicity Identification Evaluation and determined that Zinc contributed to algal toxicity. Therefore, the Discharger is currently implementing a Toxicity Reduction Evaluation, including source control and waste minimization, aimed at controlling zinc (and other metal) concentrations in effluent from the plant. Thus, as of the issuance date of this permit, the Discharger is implementing Step 4 of the Chronic Toxicity Requirement (Section B.3.2.)

With respect to Acute Toxicity, the Discharger has completed the screening phase and the Regional Board has previously approved 3-spined stickleback as the selected test organism.

34. The Discharger has constructed the Emily Renzel Wetlands enhancement project located on the previous ITT site (in the Palo Alto Baylands), near the treatment plant. Funding for the project was acquired from the California Coastal Conservancy. The project diverts approximately 1 mgd of final effluent to create a 15 acre freshwater marsh that drains into Matadero Creek. The project also includes an inlet on the south arm of the previous Palo Alto Harbor to permit salt water inflow into a series of existing sloughs and development of salt marsh habitat on the project site.

35. Emily Renzel Wetlands is operated to enhance beneficial uses of reclaimed water, and as such qualifies for Board consideration of an exception to the discharge prohibitions stated in Finding 14 above. The diversion of 1 mgd of treatment plant effluent to an alternate discharge point does not allow an increase in the 39 mgd capacity of the plant.

36. The Board adopted Resolution 77-1 specifically establishing its Policy regarding the use of wastewater to create, restore, maintain, and enhance marsh lands. The Discharger submitted a Marsh Enhancement Plan that outlines operations of the Emily Renzel Wetlands project, future enhancement of the wetlands, and a program for protection of rare and endangered species. The Discharger measured metals in the sediment of the marsh before operations began, and periodically thereafter in waters and sediments. As vegetation and animals in the marsh ecosystem increase, additional studies to monitor the health of the marsh may be considered.

37. Department of Health Services guidelines require that the discharge to the Emily Renzel Wetlands should not exceed a 7 sample median coliform limit of 23 MPN/100 ml to protect public health. The discharge currently meets that requirement.

38. The Discharger is hereby notified that the Board will consider amendment of the Emily Renzel Wetlands requirements as necessary to protect other beneficial uses (e.g., aquatic habitat). The consideration of amendments will depend on demonstrated effects of the wetlands operations on other beneficial uses of the waters of the state.

39. The Discharger operates a Reclaimed Water System serving golf courses, parkland, roadside watering, construction site uses, street sweepers, and other incidental uses. A Water Reclamation Master Plan and EIR was completed in 1994 which identified additional users and included a conceptual plan for phased increases to the Discharger's Reclaimed Water System. It was determined that implementation of the expansion would be deferred and reconsidered should the conditions present in 1994 change significantly.

40. **Treatment of Plant Stormwater Discharges**

Federal Regulations. Federal Regulations for storm water discharges were promulgated by the US Environmental Protection Agency on November 19, 1990. The regulations 40 Code of Federal Regulations Parts 122, 123, and 124 require specific categories of industrial activities including Publicly Owned Treatment Works which discharge storm water associated industrial activity to obtain a NPDES permit and to implement Best Available Technology Economically Achievable and Best Conventional Pollutant Control Technology to control pollutants in industrial storm water discharges.

The Discharger has requested the Regional Board to address all storm water flows from the wastewater treatment facility process areas in this permit. These storm water flows are directed to the wastewater treatment plant headworks and are treated along with the

wastewater discharged to the treatment plant. This permit now also regulates the discharge of industrial storm water from this facility.

41. **Local Pretreatment Program**

Source Control and Pollution Prevention Programs. The Discharger has implemented and is maintaining an effective US EPA approved pretreatment program in accordance with Federal pretreatment regulations (40 CFR 403) and this Board's blanket Order No. 95-015. As documented in quarterly and annual reports, the Discharger continues to satisfactorily implement effective source control, pollution prevention, and waste minimization programs in accordance with Basin Plan requirements and in coordination with the storm water program. These programs have been successful in reducing the industrial/commercial contribution of metals of concern to levels similar to those from residential sources.

Settlement Agreement. On February 17, 1993, the Discharger signed an agreement with Clean South Bay, a coalition of environmental groups, concerning the source control program for the treatment plant. The agreement included source control measures to reduce the concentration and mass of metals in the influent from industrial, residential commercial and corrosion/water supply sources, and was incorporated into Attachment 1 of the 1993 CDO. The Agreement expired in February 1998, and the CDO was nullified by the State Board court-ordered remand. Source control tasks contained in the 1993 CDO are primarily aimed at investigating and implementing additional reasonable controls on sources of nickel and copper discharges to the treatment plant.

The Discharger has fully complied with all the requirements of the CDO and continues to implement aggressive source control, pollution prevention, and waste minimization programs. The Dischargers source control efforts have contributed to the Dischargers ability to comply with 1993 Permit effluent limits for all pollutants except copper. The Discharger continues annually to evaluate the effectiveness of its source control programs and to investigate additional reasonable measures the programs might implement to further reduce influent loadings.

42. **O&M Manual**. An Operations and Maintenance (O&M) Manual is maintained by the Discharger for purposes of providing plant and regulatory personnel with a source of information describing all equipment, recommended operation strategies, process control monitoring, and maintenance activities. The Discharger will update the O&M manual annually according to the requirements of Provision 15.

43. This Order serves as an NPDES permit, reissuance of which is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code (CEQA) pursuant to Section 13389 of the California Code.

44. The Discharger and interested agencies and persons have been notified of the Regional Board's intent to reissue the NPDES permit for this discharge and have been provided an opportunity to submit their written comments and appear at the public hearing.

45. The Regional Board, at a properly noticed public meeting, heard and considered comments pertaining to the discharge.

IT IS HEREBY ORDERED that the Discharger, in Order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder and the provisions of the Clean Water Act as amended and regulations and guidelines adopted thereunder, shall comply with the following provisions:

A. Discharge Prohibitions

1. Discharge of waste to waters of San Francisco Bay south of the Dumbarton Bridge or tributaries is prohibited.

2. Discharge of waste not receiving initial dilution of at least 10 to 1 is prohibited.

3. Discharge of waste to dead-end sloughs or confined waterways is prohibited.

4. There shall be no bypass or overflow of untreated wastewater to waters of the State at the treatment plant or from the collection system under the control of the Discharger.

5. The average dry weather flow shall not exceed 39 mgd, determined by the average during the months of June through October. This flow limit includes 1 mgd of groundwater clean-up flows and 38 mgd of industrial and domestic flows. Groundwater clean-up flows should not occur during wet weather periods and should be consistent with local pretreatment limits and other requirements.

6. Discharges of water, materials, or wastes other than storm water, which are not otherwise authorized by this NPDES permit, to a storm drain system or waters of the State are prohibited.

7. Consistent with State Board Order WQ 90-5, this Order contains effluent limitations which are substantially equivalent to the water quality based effluent limits in the 1993 Permit. Studies to develop water quality based mass loading limits for metals, measures to maximize reclamation and minimize the effluent discharge; and the continued operation and maintenance of the treatment plant at a high degree of reliability are either in place or required by this permit. Therefore, the Discharger is granted an exception to discharge prohibitions 1 through 3, based on a finding of equivalent level of environmental protection, conditioned upon compliance with the aforementioned requirements.

B. Effluent Limitations

1. The discharge of effluent containing constituents in excess of the following limits is prohibited:

Conventional Pollutants

The discharge of an effluent containing constituents in excess of the following limits is prohibited:

Constituent	Unit	Monthly Average	Daily Maximum	Instantaneous Maximum
a. BOD	mg/l	10	20	-
b. Ammonia-N	mg/l	3	8	-
c. Suspended Solids	mg/l	10	20	-
d. Oil and Grease	mg/l	5	10	-
e. Settleable Matter	mg/l-hr	0.1	-	0.2
f. Turbidity	NTU	-	-	10
g. Chlorine Residual	mg/l	-	-	0.0

2. The discharge shall not have pH of less than 6.5 nor greater than 8.5.

3. **Effluent Toxicity**

3.1 **Acute Toxicity**:

A. Definition: The survival of organisms in undiluted effluent shall be an 11-sample median value of not less than 90 percent survival, and a 90 percentile value of not less than 70 percent survival. The 11-sample median and 90th percentile effluent limitations are defined as follows:

11-sample median: Any bioassay test showing survival of 90 percent or greater is not a violation of this limit. A bioassay test showing survival of less than 90 percent represents a violations of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival;

90th percentile: Any bioassay test showing survival of 70 percent or greater is not a violation of this 90 percentile value limit. A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit, if one or more of the past ten or less tests shows less than 70 percent survival.

B. Test Species and method:

Bioassays shall be performed monthly using a species which is determined to be the most sensitive species following an acute toxicity screening performed by the Discharger. Tests shall be 96-hour flow-through bioassays on a frequency of one per month. Bioassays shall be conducted in compliance with the "Methods for Measuring The Acute Toxicity of Effluents and Receiving Water To Freshwater and Marine Organisms", 3rd. edition, with exceptions granted the Discharger by this Regional Board and the Environmental Laboratory Accreditation Program (ELAP).

3.2 **Chronic Toxicity**:

A. Definition: Compliance with the Basin Plan narrative chronic toxicity objective shall be demonstrated according to the following tiered requirements based on results from representative samples of the treated final effluent meeting test acceptability criteria:

1. routine monitoring;

2. accelerated monitoring (bi-weekly) after exceeding a three sample median value of 1 TUc(1) or a single sample maximum of 2 TUc or greater;

3. return to routine monitoring if accelerated monitoring does not exceed either trigger in 2;

4. initiate approved TIE/TRE workplan if accelerated monitoring confirms consistent toxicity above either trigger in 2;

5. return to routine monitoring after appropriate elements of TRE workplan are implemented and toxicity drops below trigger level in 2, or as directed by the Executive Officer

(1) A TUc equals 100 divided by the no observable effect level (NOEL). The NOEL is determined from IC, EC, or NOEC values. Monitoring and TRE requirements may be modified by the Executive Officer in

response to the degree of toxicity detected in the effluent or in ambient waters related to the discharge.

B. Test Species and Methods

The Discharger shall conduct routine monitoring with a species determined to be the most sensitive species during a chronic toxicity screening performed by the Discharger. Bioassays shall be conducted in compliance with the "Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Water to West Coast Marine and Estuarine Organisms," (EPA/600/R-95/136, August 1995), or other guidance approved by the Executive Officer, with exceptions granted the Discharger by this Regional Board and the Environmental Laboratory Accreditation Program (ELAP).

4. Concentration Criteria for Toxic Pollutants

The effluent shall not exceed the following concentration limits:

Constituent	1-day Avg. (ug/l)+		4-day Avg. (ug/l)+		Monthly Avg. (ug/l)+	
Copper	12	(F,G)				
Cyanide	5	(A,C)				
Mercury	2.1	(A,B,G)			0.025	(A, C,G)
Nickel			8.3	(A,B,G)		
Selenium	2.0	(A,G)				
Tributyl Tin	0.04	(A)			0.005	(A,D)

\+ - Compliance determinations shall be based on available analyses for the time interval associated with effluent limitation. When only one sample analysis is available in a specified time interval (e.g., 30-day average or 4-day average), that sample shall serve to characterize the discharge for the entire interval. For 4-day averages, compliance with the effluent limitation may be demonstrated by concentrations of four consecutive 24-hour composite samples, as well as the average of the four.

A - Limit same as July 21, 1993 permit limit.

B - This limit, based on the Basin Plan and EPA water quality criteria, is solely for the purposes of this permit and only for the duration of the permit.

C - This limit comes from the 1995 Water Quality Control Plan in Tables 3-3 and 3-4. This limit exists solely for the purposes of this permit and only for the duration of the permit.

D - On August 7, 1997 EPA proposed a 4-day average water quality criterion for tributyl tin of 0.010 ug/l. A limit of 0.005 ug/L, which is based on the Basin Plan, is solely for the purposes of this permit and only for the duration of the permit. When the EPA criterion is promulgated, the Board may reopen this permit to consider revising the limit to conform with the new criterion.

F - The limit is based upon recent (1995-1997) plant performance at the 99.7 percentile level and is solely for the purposes of this permit and only for the duration of the permit.

G - Metal limits are expressed as total recoverable metals.

4.1 Final water quality-based effluent limitations for copper and nickel will be implemented prior to July 1, 2003. Limits will be based on data developed by the Discharger (consistent with Provision 5 of this Order), which will be used to develop site-specific objectives and Total Maximum Daily Load (TMDL) studies. If the studies do not produce the required data the Board will base final water quality based effluent limits on applicable State or federal water quality criteria available at that time. If neither site specific objectives nor water quality criteria are available, the following performance based limit shall take effect; 8.2 ug/l for copper, one-day average.

4.2 **Concentration Goals for Toxic Pollutants**

The values stated in this table are goals rather than effluent limitations per footnotes A and B below.

Constituent	1-day Avg. $(ug/l)_+$	4-day Avg. (ug/l)+	Monthly Avg. (ug/l)+
Hexachlorobenzene			0.00069
Aldrin			0.00014
alpha-BHC			0.013
beta-BHC			0.046
gamma-BHC	0.16		0.062
Chlordane*	0.004		0.000081
DDT*	0.001		0.0006
Dieldrin	0.0019		0.00014
Endosulfan*	0.0087		2.0
Endrin*	0.0023		0.8
Heptachlor	0.0036		0.00017
Heptachlor Epoxide			0.00007
PCBs*	0.03		0.00007
Toxaphene	0.0002	0.00069	
PAHs*	15		0.031
TCDD	1.4E-08		

* - Analytical definition of constituent found in Attachment B of this permit "Organic Priority Pollutants Definitions"

A - Goal same as July 21, 1993 permit limit.

B. The values stated in this Table are goals rather than effluent limitations. The stated goal is below the level of detection. The pollutant has not been detected in the discharge using standard sampling and analytical procedures. A goal at this level is solely for the purposes of this permit and only for the duration of the permit. The goal comes from the 1991 Enclosed Bays and Estuaries Plan. If any of these goals is ultimately converted to an effluent limitation, the Regional Board will make appropriate adjustments in data reporting requirements for any constituent where a number of related individual constituents have been aggregated into a group for which a single number applies in order to avoid creating an anomalous situation where the aggregation of reported values for a series of non-detects could lead to a false exceedance of such single number.

5. Mass Criteria for Pollutants

A. The following Mass Emission Limits for conventional pollutants where concentration limits are expressed in mg/l shall apply:

(Mass Emission Limit in kg/day) = (Concentration Limit in mg/l) x (Actual Flow in million gallons per day averaged over the time interval to which the limit applies) x 3.785 (conversion factor).

B. The effluent mass loadings for toxic pollutants shall not exceed the following mass loading limits:

Constituents	Annual Limit (lb/yr) (A,B)
Arsenic	158
Cadmium	237
Chromium (VI)	474
Copper	1580
Lead	790
Mercury	16
Nickel	948
Selenium	100
Silver	127
Zinc	5925
Cyanide	1659
Phenol	3950
PAHs	1580

Notes

A. Mass limits same as in Order No. 91-068. Metal limits based on average flow data from 1985-1988 and average concentration data from 1989. According to the Basin Plan, after a wasteload allocation (for copper) is implemented in permits and load reductions consistent with that allocation are occurring, the Board will reevaluate the effluent concentration limitations for copper. Limits for cyanide, phenols, and PAHs are based on 1985-1988 average flow data and 1989 performance data.

B. In calculating compliance, the Discharger will count all non-detect measures at the detection level. if a mass limit violation is observed, and non-detects contribute to the violation, the Discharger will improve monitoring capabilities for the specific constituent, and the violations will be evaluated with consideration of the detection limits.

Mass loading should be calculated for each analytical result (e.g., for weekly measures, calculate loadings weekly using average weekly flow data. The Discharger shall submit a cumulative total of mass loadings for the previous twelve months with each Self-Monitoring Report). Compliance will be determined based on the previous twelve months of monitoring, and will be calculated weekly for weekly measures, and monthly for monthly measures. Monitoring data collected under accelerated schedules should be time-weighted when calculating the average annual loading.

For performance-based mass limits: Because mass may increase during heavy rainfall years and wet year data were not considered in the development of these limits, exceedances during wet weather years will be evaluated separately.

6. Percent Removal BOD and TSS

The arithmetic mean of values for BOD and suspended solids in effluent samples collected in each monthly reporting period shall not exceed 15% of the arithmetic mean of respective values for influent samples collected at approximately the same times during the same monthly period, i.e. 85% removal.

7. Coliform Bacteria

The treated wastewater, at some point in the treatment process prior to discharge, shall meet the following limits of bacteriological quality:

a. The moving median value for the Most Probable Number (MPN) of total coliform bacteria in any five (5) consecutive samples shall not exceed 23 MPN/100 mL; and

b. Any single sample shall not exceed 240 MPN/100 mL.

The Discharger may use alternate limits of bacteriological quality instead of meeting 7.a and 7.b above (total coliform limits) during a study to determine appropriate limits if the Discharger can establish to the satisfaction of the Executive Officer that the use of fecal coliform limits will not result in unacceptable adverse impacts on the beneficial uses of the receiving water:

C. Receiving Water Limitations

1. The discharge of waste shall not cause the following conditions to exist in waters of the State at any place:

   A. Floating, suspended, or deposited macroscopic particulate matter, or foam;

   B. Bottom deposits or aquatic growths;

   C. Alteration of temperature, turbidity, or apparent color beyond present natural background levels;

   D. Visible, floating, suspended, or deposited oil or other products of petroleum origin;

   E. Toxic or other deleterious substances to be present in concentrations or quantities which will cause deleterious effects on aquatic biota, wildlife, or waterfowl, or which render any of these unfit for human consumption either at levels created in the receiving waters or as a result of biological concentration.

2. The discharge of waste shall not cause the following limits to be exceeded in waters of the State within one foot of the water surface:

Constituent	Limit
A. Dissolved Oxygen	5.0 mg/L minimum. Median of any three consecutive months shall not be less than 80% saturation. When natural factors cause lesser concentrations than those indicated above, then this discharge shall not cause further reduction in the concentration of dissolved oxygen.

B.	Dissolved Sulfide	0.1 mg/L maximum.
C.	pH	Variation from natural ambient pH causing unreasonable effects on beneficial uses.
D.	Un-ionized Ammonia	0.025 mg/L as N, annual median. 0.4 mg/L as N, maximum.

3. Any applicable receiving water quality standard for receiving waters adopted by the Regional Board or the State Water Resources Control Board, as required by the Clean Water Act or amendments thereto, including the chronic toxicity objective, shall be met within 250 feet of the point of discharge. In the case of marine water quality objectives, the standard shall be met where the salinity is greater than or equal to 5 parts per thousand 75% of the time.

   If applicable water quality standards are promulgated or approved pursuant to Section 303 of the Clean Water Act, or amendments thereto that supersede the basis for this permit, the Regional Board will revise or modify this Order in accordance with the applicable objectives and implementation policies established by the State Board.

D. Biosolids/Sludge Requirements

1. For Biosolids management, the Discharger shall comply with all requirements of 40 CFR Part 503.

2. The Discharger of biosolids shall not allow waste material to be deposited in the waters of the State.

3. The Discharger shall submit an annual report to the US EPA and the Regional Board containing reuse information and other information requirements as specified by 40 CFR Part 503.

E. Provisions

1. Permit Compliance

The Discharger shall comply with the limitations, prohibitions, and other provisions of this Order immediately upon adoption by the Board. The Board may reopen this permit to add numeric limits for any constituent that in the future exhibits reasonable potential to cause or contribute to a exceedance of a water quality standard.

2. Wastewater Reclamation

The Discharger shall review and update its Water Reclamation Master Plan for the Regional Water Quality Control Plant, dated April 1994. The review shall evaluate opportunities for reclamation within its own service area and in cooperation with other South Bay Dischargers. A report acceptable to the Executive Officer shall be submitted by July 1, 1999.

3. Special Effluent Study for Certain Organic Pollutants

The Discharger shall, jointly with the other lower South Bay Dischargers, conduct low-level monitoring with ultra clean procedures for those pollutants in B.4.2. The Dischargers shall utilize 3-5 laboratories and determine the reproducibility of results over a two-year

period conducting sampling on a semi-annual basis. The purpose of this work is to establish the pollutant levels in the effluent using ultra-clean sampling procedures and low-level analytical procedures. To the extent that non-EPA approved (40CFR136) methods are used, the results will not be used for compliance purposes.

Submit Work Plan	December 1, 1998
Submit Final Report	January 31, 2001

4. **Mercury Reduction Investigation.**

The Discharger shall submit a report by December 1, 2001 documenting mercury removal across the treatment plant and evaluating potential measures for further mass loading reductions.

5. **Watershed Management Initiative Support**

The Discharger shall participate with the Regional Board staff, other Dischargers in the Lower South Bay, representatives of the public and other concerned parties as described below in carrying out the Santa Clara Basin Watershed Management Initiative (WMI) tasks set forth in the Bay Monitoring and Modeling Workplan dated July 29, 1997 aimed at development of a TMDL. The Discharger shall participate in such a manner by attending through its representatives meetings of the Core Group of the WMI, as well as meetings of the Bay Modeling and Monitoring Subgroup and the Regulatory Subgroup. The Discharger shall review and comment upon all technical and other proposals developed by the foregoing groups of the WMI. The Discharger shall make technical information in its possession available to the appropriate groups of the WMI necessary to develop the watershed management reports. The Discharger shall report to the Executive Officer every six months, in the annual and semiannual Pretreatment Program Reports, as part of the watershed programs status update, describing its efforts for the prior six months in cooperating with the WMI.

6. **Mercury TMDL Participation**

The Discharger shall participate with the Regional Board and other South Bay Dischargers in identifying cross media watershed-wide sources of mercury impacting the receiving water and potential control measures. The Discharger shall also participate in Regional Board TMDL process development of site specific objectives and/or a wasteload allocation and mass effluent limits for mercury. This study shall be conducted in accordance with the following tasks and time schedule:

a.	Submit a participation plan, acceptable to the Executive Officer, for participation in Region-wide mercury phased TMDL investigations.	December 1, 1998
b.	Following approval by the Executive Officer, commence work in accordance with the study plan and time schedule submitted pursuant to Task 6.a.	60 days after EO approval

7. **Compliance with Acute Toxicity Limits** (Effluent Limitation B.3. of this Order)

a. Compliance with the acute toxicity limitation in effluent limitation B.3 of this Order shall be evaluated by measuring survival of test fishes exposed to undiluted effluent of 96 hours. Each fish species represents a single sample.

b. Two fish species will be tested concurrently. These shall be the most sensitive two species determined from concurrent screening(s) of three species: three spine stickleback, rainbow trout and fathead minnow according to a workplan approved by the Executive Officer. The

three species screening requirement can be met using either flow-through or static renewal bioassays, and all tests must be completed within ten days of initiating the first test. If concurrent screenings have been conducted prior to this permit reissuance, the existing data may be submitted to the Board. If such information is found to meet the requirements of the Basin Plan, further screenings would not be required.

c. The Regional Board may consider allowing compliance monitoring with only one (the most sensitive, if known) fish species, if the following condition is met: the Discharger can document that the acute toxicity limitation, specified above, has not been exceeded during the previous three years, or that acute toxicity has been observed in only one of two fish species.

d. The toxicity tests will be performed according to protocols approved by the US EPA or State Board or published by the American Society for Testing and Materials (ASTM) or American Public Health Association, or as directed in writing by the Executive Officer. The Discharger may continue using current test methods until receipt of written guidance from the Executive Officer or State Board on conducting the new procedures and on interpreting compliance results compared with current method test results.

8. **Chronic Toxicity Reduction Evaluation**

If there is a consistent exceedance of either of the chronic toxicity monitoring triggers, the Discharger shall implement a tiered chronic toxicity reduction evaluation (TRE), in accordance with a TRE work plan acceptable to the Executive Officer. The TRE shall be initiated within 15 days of the date of violation. The purpose of the TRE is to investigate the causes of and to identify corrective control actions in response to effluent toxicity incidents. The objective of the TRE is to narrow the search for effective control measures for effluent toxicity. TREs need to be site specific but should follow EPA guidance and be conducted in a step-wise fashion.

Tier I includes basic data collection, followed by Tier 2 which evaluates optimization of the treatment system operation, facility housekeeping, and the selection and use in-plant process chemicals. If unsuccessful in reducing toxicity, Tier 3, a toxicity identification evaluation (TIE), should be initiated and all reasonable efforts using currently available TIE methodologies employed. Assuming successful identification or characterization of the toxicant(s), Tier 4 is to evaluate final effluent treatment options and Tier 5 is to evaluate within plant treatment options. Tier 6 consists of follow-up and confirmation once the toxicity control method has been selected and implemented.

Many recommended TRE elements parallel source control, pollution prevention, and stormwater control program best management practices (BMPs). To prevent duplication of effort, evidence of complying with those requirements may be sufficient to comply with TRE requirements. By requiring the first steps of a TRE to be accelerated testing and review of the facility's TRE workplan, a TRE may be ended in its early stages. All reasonable steps shall be taken to reduce toxicity to the required level. The Board recognizes that identification of causes of chronic toxicity may not be successful in all cases. Consideration of enforcement action by the Board will be based in part on the Discharger's actions in identifying and reducing sources of consistent toxicity.

9. **Chronic Toxicity Screening Phase Monitoring**

The Discharger shall conduct screening phase monitoring as described in the Self-Monitoring Program under either of these two conditions:

a. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant

concentrations attributable to pretreatment, source control, and waste minimization efforts; or

b. Prior to Permit reissuance, except when the Discharger is conducting a TRE/TIE. Screening phase monitoring data shall be included in the NPDES Permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.

The Discharger shall conduct screening phase monitoring in accordance with a proposal submitted to, and acceptable to the Executive Officer. The proposal shall contain, at a minimum, the elements specified in Part B of the Self-Monitoring Program of this Order, or alternatives as approved by the Executive Officer. The purpose of the screening is to determine the most sensitive test species for subsequent routine compliance monitoring for chronic toxicity.

10. **Pretreatment Program**. The Discharger shall implement and enforce its approved pretreatment program in accordance with Board Order 95-015 and its amendments thereafter. The Discharger's responsibilities include, but are not limited to:

a. Enforcement of National Pretreatment Standards (e.g., prohibited discharges, Categorical Standards) as provided in 40 CFR 403.5 and 403.6;

b. Development and enforcement of local limits that implement the requirements of 40 CFR 405.3(c);

c. Implementation of the pretreatment program in accordance with legal authorities, policies, procedures, and financial provisions described in the General Pretreatment regulations (40 CFR 403) and its approved pretreatment program.

d. Submission of annual and semiannual reports to EPA and the State as described in Board Order 95-015, and its amendments thereafter, with the exception that the annual report may be submitted by March 31.

e. The Discharger has developed an appropriate methodology to quantify flows and copper and mercury concentrations from residential, commercial, industrial and other sources. Loading estimates have been submitted annually and will be updated annually and submitted with the Annual Pretreatment Report. Significant increases will be analyzed and modifications to existing programs (including the pretreatment program) will be developed as needed.

11. **Self Monitoring Program**

The Discharger shall comply with the attached Self-Monitoring Program. The Executive Officer may make minor amendments to the Self-Monitoring Program pursuant to federal regulations (40 CFR 122.63).

12. **Watershed Program Updates, Modifications, and Reporting Requirements**:

The Discharger shall report to the Executive Officer any updates, changes or modifications to its watershed programs found in this Order semi-annually: March 31 and July 31. The program modifications will be included as a part of the semi-annual pretreatment program reports. The Discharger may implement modifications to individual program elements if the Executive Officer has not disapproved of the change within 45 days of being notified.

13. The following constituents (i.e. arsenic, cadmium, chromium, lead, silver, zinc, chloroform, halomethanes, and phenol) do have detection limits below water quality criteria

but have been found not to have a reasonable potential to exceed effluent water quality limits. If a pollutant concentration increases significantly, the Discharger shall conduct weekly (or other frequency approved by the Executive Officer) monitoring to establish a dataset (greater than 20 values) to perform a reasonable potential analysis. Results shall be reported to the Regional Board and if the Executive Officer determines that significant increases in the concentrations of these constituents have occurred, the Discharger shall redo the reasonable potential analysis and investigate the source of the increases and establish remedial measures if increases pose a threat to water quality.

14. The Discharger shall comply with all items in the attached "Standard Provisions, Reporting Requirements, and Definitions".

15. The Discharger shall review and update its Operation and Maintenance Manual annually, or in the event of significant facility or process changes, shortly after such changes occur. Annual revisions, or letters stating that no such changes are needed shall be submitted to the Regional Board by April 15 of each year.

16. The Discharger shall annually review and update its Contingency Plan. The discharge of pollutants in violation of this Order, where the Discharger has failed to develop and/or implement a contingency plan will be the basis for considering such discharge a willful and negligent violation of this Order, pursuant to Section 13387 of the Water Code.

17. This Order expires on June 17, 2003. The Discharger must file a report of waste discharge in accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code not later than 180 days before this expiration date as application for reissuance of waste discharge requirements.

18. The requirements of this Order supersede the requirements of Orders 93-085, and Cease and Desist Order 93-083. Orders 93-085, and Cease and Desist Order 93-083 are hereby rescinded.

19. This Order shall serve as a National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the Clean water Act or amendments thereto, and shall become effective 10 days after the date of its adoption, provided the Regional Administrator, US EPA, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on June 17, 1998.

Loretta K. Barsamian
LORETTA K. BARSAMIAN
EXECUTIVE OFFICER

Attachments:
A: History of 1993 Permits
B: Organic Pollutant Definitions
Self Monitoring Program
Standard Provisions and Reporting Requirements

ATTACHMENT A

HISTORY OF 1993 PERMIT LIMITS.

1. **Statewide Plans and Basin Plan Amendments 1991-1993.** The State Board adopted two statewide water quality control plans in April 1991: the Enclosed Bays and Estuaries Plan and the Inland Surface Waters Plan (Statewide Plans). The Board adopted a revised Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) in December 1991, based on the Statewide Plans. The Regional Board amended the Basin Plan in October 1992 to adopt a site-specific objective of 4.9 g/l for copper for San Francisco Bay. The Regional Board amended the Basin Plan in June 1993 to adopt a region-wide wasteload allocation for copper. The provisions of the 1993 Permit, when adopted, were based in part upon these latter two Basin Plan amendments which had been adopted by the Regional Board but not yet been approved by the State Board.

2. **Objectives in Statewide Plans as Basis for 1991 and 1993 Permits.** The 1993 Permit contains, as did the Dischargers NPDES Permit issued in April 1991, effluent limits for metals and organics based on objectives in the State Board's 1991 Statewide Plans which were rescinded in 1994 and are no longer in effect.

3. **Plant Performance Based Limits.** For certain constituents, namely arsenic, chromium (VI), selenium, and phenol, the effluent limitations contained in the Discharger's February 20, 1990 NPDES permit amendments were lower than the numeric water quality objectives contained in the Statewide Plans. The February 20, 1990 effluent limitations were based on plant performance (the 95th percentile values of 1989 effluent data), with compliance evaluated on a matching 95th percentile basis. The Board carried these performance based effluent limitations over into both the Discharger's April 17, 1991 NPDES permit amendments and, in turn, into the 1993 Permits.

4. **Mass Limits and the Anti-Degradation Baseline.** State Board Order WQ 90-5 required the Board to impose an anti-degradation baseline on the Discharger in the form of mass limits for certain toxic pollutants. These mass limits were required to be calculated on the basis of average flow data from 1985-1988 (representing drought and non-drought years) and average concentration data from 1989. Mass limits were imposed by the Board in the Discharger's April 17, 1991 NPDES permit amendments and were carried forward into the 1993 Permits, unchanged except for copper, where a new mass limit was imposed, which was based on the wasteload allocation adopted by the Board in June 1993 and remanded in 1994. Given the remand of authority upon which the new mass limit was based, the mass limit for copper contained in this Order is based on the original formula for calculating such a limit contained in WQ 90-5.

5. **Interim Limits for Copper, Nickel, and Cyanide in CDO.** Since the 1993 Permit daily maximum copper, nickel, and cyanide limits were not attainable, the concurrently issued 1993 CDO contains interim limits based on plant performance. The interim daily maximum limits were set at the 95th percentile of plant performance concentrations during the period from January 1992 to May 1993. Compliance was evaluated based on the 95th percentile of plant effluent quality.

6. **Source Control.** On July 21, 1993 the Board, concurrently with the issuance of the 1993 Permit, issued the 1993 CDO. The 1993 CDO contained requirements for the Discharger to implement a comprehensive program for regulating indirect discharges of pollutants (primarily copper and nickel) from commercial and industrial sources. This program was based, in part, upon an agreement between the Discharger and certain environmental groups. In taking this step, the Board found "Source control, including waste

minimization, is a more desirable pollutant reduction technique than structural modification at the Discharger's plant.".

ATTACHMENT B

ORGANIC AND PRIORITY POLLUTANTS SPECIAL DEFINITIONS

CHLORDANE shall mean the sum of chlordane-alpha, chlordane-gamma, chlordene-alpha, chlordene-gamma, nonachlor-alpha, nonachlor-gamma, and oxychlordane.

CHROMIUM VI limit may be met by analysis for total or hexavalent chromium.

DDT shall mean the sum of the p,p' and o,p' isomers of DDT, DDD (TDE), and DDE.

ENDOSULFAN shall mean the sum of endosulfan-alpha, endosulfan-beta, and endosulfan sulfate.

ENDRIN shall mean the sum of endrin and endrin aldehyde.

HALOMETHANES shall mean the sum of bromoform, bromomethane (methyl bromide), chloromethane (methyl chloride), chlorodibromomethane, and dichlorobromomethane.

PAHs (polynuclear aromatic hydrocarbons) shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzofluoranthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[ah]anthracene, fluorene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene.

PCBs (polychlorinated biphenyls) shall mean the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM
FOR
CITY OF PALO ALTO

PALO ALTO REGIONAL WATER QUALITY CONTROL PLANT

SANTA CLARA COUNTY

NPDES NO. CA0037834

ORDER NO. 98-054

CONSISTING OF
PART A (Dated August 1993) and PART B

SELF-MONITORING PROGRAM
FOR
CITY OF PALO ALTO

PART B

I. DESCRIPTION OF SAMPLING STATIONS

A. INFLUENT AND INTAKE

Station	Description
A-001	At any point in the treatment facilities headworks at which all waste tributary to the system is present.

B. EFFLUENT

Station	Description
E-001	At any point in the outfall from the treatment facilities between the point of discharge and the point at which all waste tributary to that outfall is present (May be the same as E-001-D).
E-001-D	At any point in the disinfection facilities for waste at which point adequate contact with the disinfectant is assured.

C. RECEIVING WATERS

Station	Description
C-1	Located near Sand Point, approximately 2,000 feet east of where the unnamed, man-made slough conveying the effluent flows into South San Francisco Bay.

D. LAND OBSERVATIONS

Station	Description
P-1 thru P-'n'	Located at the corners and midpoints of the perimeter fenceline surrounding the treatment facilities. (A sketch of the locations of these facilities will accompany each report)

E. OVERFLOWS AND BYPASSES

Station	Description
OV-1 thru OV-'n'	Bypasses or overflows from manholes, pump stations, or collection systems.

F. SLUDGE

The discharger shall continue to analyze sludge pursuant to the pretreatment requirements of Order 95-015

II. SCHEDULE OF SAMPLING

The schedule of sampling and analysis shall be that given in Table 1, except for sludge. Sludge sampling shall follow the schedule and analyses specified by Order 84-60, as amended.

III. ITT MARSH MONITORING

A. DESCRIPTION OF SAMPLING STATIONS

1. INFLUENT AND EFFLUENT

Station	Description
E-1	Located at the marsh discharge point, and consisting entirely of discharge from the marsh.

2. MARSH WATERS AND SEDIMENTS

Station	Description
1-A,1-B,1-C,1-D, 1-E,2-A,2-B,2-C, 2-E,3-A	As specified in Figure A (attached)
Matadero Creek	At the point where Matadero Creek passes beneath the Bayshore Freeway

B. SCHEDULE OF SAMPLING AND ANALYSIS

The schedule of sampling and analysis shall be that given in Table 2.

IV. MODIFICATIONS TO PART A

Add to Section F.4.e:

Include in each monthly report the following:

Annual tabulations of all data collected through the year up to the reported month to date for acute toxicity, monthly flow, and influent and effluent metals and cyanide. For metals and cyanide, include influent and effluent concentration and mass data. On a monthly basis, report the minimum, maximum, 95th percentile, and average metals and cyanide concentration values for the year, through the reported month. Report most recent twelve months total mass discharged for metals and cyanide.

Receiving water data shall be summarized and reported to the Board annually. Annual

reporting shall be consistent with Regional Monitoring Program reporting format and shall be coordinated with the receiving water monitoring programs of the San Jose/Santa Clara WPCP and the Sunnyvale WPCP.

I, Loretta K. Barsamian, Executive Officer, hereby certify that the following Self-Monitoring Program:

1. Has been developed in accordance with the procedures set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Board Order 98-054.

2. Has been revised and ordered by the Board on June 17, 1998.

3. May be revised by the Executive Officer pursuant to federal regulations (40 CFR 122.36); other revisions may be ordered by the Board.

Loretta K. Barsamian
Executive Officer

Attachments:
Table 1
Table 2
Figure A - ITT Marsh sampling sites
Part A (dated August 1993)

Table 1
Schedule of Sampling, Measurement, and Analysis (3)
City of Palo Alto

Sampling Station --->	A-001	E-001			E-001D	C (5)	All P Stations	All OV Stations
Type of Sample --->	C-24	G (2)	Cont.	C-24	G	G	G	G
Flow Rate (mgd)	D		D					
BOD ,5-day, 20 C (1) (mg/l & lb/day)	W			W				
Total Suspended Solids (1) (mg/L & lb/day)	W			W				
Oil and Grease (mg/L & lb/day)		M						
Total Coliform (6) (MPN/100 ml)					3/W			
Chlorine Residual & Dosage (4) (mg/l & lb/day)			cont.					
Acute Toxicity-96 hr, Flow-through (7) (% survival in undiluted effluent)				M				
Chronic Toxicity (8)				M				
Dissolved Oxygen (mg/L & % Saturation)		D						
Dissolved Sulfides (mg/L if DO<5.0 mg/L)		D						
pH (units)		D						
Ammonia Nitrogen (mg/L & lb/day)				W				
Nitrate Nitrogen (mg/L & lb/day)				M				
Nitrlte Nitrogen (mg/L & lb/day)				M				
Total Organic Nitrogen (mg/L & lb/day)				M				
Total Phosphate (mg/L & lb/day)				M				
Turbidity, Nephelometric (NTU)				W				
Arsenic (µg/L & lb/day)	M			M				
Cadmium (µg/L & lb/day)	M			M				
Chromium, Total (µg/L & lb/day)	M			M				
Copper (µg/L & lb/day)	W			W				

Table 1
Schedule of Sampling, Measurement, and Analysis (3)
City of Palo Alto

Sampling Station --->	A-001	E-001			E-001D	C (5)	All P Stations	All OV Stations
Type of Sample --->	C-24	G (2)	Cont.	C-24	G	G	G	G
Cyanide (µg/L & lb/day)	M			M				
Lead (µg/L & lb/day)	M			M				
Mercury (µg/L & lb/day)	M			M				
Nickel (µg/L & lb/day)	M			M				
Selenium (µg/L & lb/day)	M			M				
Silver (µg/L & lb/day)	M			M				
Zinc (µg/L & lb/day)	M			M				
Tributyltin (µg/L & lb/day)	M			M				
Phenolic compounds (ug/l & lb/day)	Q			Q				
PAH's (9) (µg/L & lb/day)	Q			Q				
All Applicable Standard Observations		D					2/W	E
Organic Priority Pollutants (10) (ug/L & lb/day)	Y			Y				

Table 1 -- Abbreviations and Footnotes
CITY OF PALO ALTO

Abbreviations used in Table 1:

Type of Samples

G = grab sample
C-24 = composite sample (24 hour)
Cont. = continuous sampling
O = Observations

Type of Stations

A = treatment facility influent stations
E = treatment facility effluent stations
L = basin and/or pond levee stations
C-n-n = receiving water stations
P = treatment facility perimeter stations
OV = bypasses or overflows from manholes, pump stations, or collection systems

Frequency of Sampling

E = each occurrence
D = once each day
W = once each week
M = once each month
Y = once each year
Q = quarterly
3/W = 3 days per week
2/W = 2 days per week
Cont = continuous

Table 1 Footnotes:

(1) Percent removal (effluent vs. influent) shall also be reported.

(2) Grab samples shall be taken on day(s) of composite sampling.

(3) If any effluent sample is in violation of limits, except those for metals, cyanide, and organics, sampling shall be increased for that parameter to at least daily or greater until compliance is demonstrated in two successive samples. Compliance measurements represent compliance status for the time period between measurements.

(4) Chlorine residual analyzers shall be calibrated against grab samples as frequently as necessary to maintain accurate control and reliable operation. If an effluent violation is detected, grab samples shall be taken every 30 minutes until compliance is achieved.

(5) Receiving water and sediment monitoring is suspended based on participation in the Regional Monitoring Program per Board Resolution No. 92-043.

(6) Compliance with the bacteriological effluent limit may be demonstrated via monitoring for fecal coliform pursuant to Effluent Limitation B.7 of this permit.

(7) Acute Toxicity testing to be performed pursuant to Provision E.7 of this permit.

(8) While the discharger is conducting its TIE/TRE study, effluent chronic toxicity monitoring will be twice per year, once during the wet season and once during the dry season. Upon

completion of the TIE/TRE study, monitoring will revert to the frequency indicated in Table 1. Chronic toxicity monitoring is to be carried out upon the species determined by the screening study as the most appropriately sensitive test organism.

(9) PAHs = Polynuclear Aromatic Hydrocarbons. PAHs shall mean the sum of acenaphthylene, anthracene, 1,2-benzanthracene, 3,4-benzogluroanthene, benzo[k]fluoranthene, 1,12-benzoperylene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, fluorene, indeno[1,2,3-c,d]pyrene, phenanthrene, and pyrene. PAH analysis must be done by EPA Method 610 or 625.

(10) Analytical definitions of organic priority pollutants are found in Attachment 2 of the permit, "Organic Priority Pollutants Definitions".

TABLE 2

SAMPLING SCHEDULE FOR ITT MARSH

City of Palo Alto

SAMPLING STATION (FIGURE A)	1-B	2-B	E-1			Matadero Creek
TYPE OF SAMPLE	Grab	Grab	Cont	Grab	C-24	4-day
Flow Rate (mgd)			D			
Total Coliform (MPN/100ml)				M		
Dissolved Oxygen (mg/L & % saturation)	W(2)	W(2)		W		
Dissolved sulfides (mg/L if DO < 5.0 mg/L)				W		
pH (units)	W(1, 2)	W(1, 2)		W		
Temperature (C)	W(1, 2)	W(1, 2)		W		
Ammonia Nitrogen (mg/L)	W(1)	W(1)				
Nitrate Nitrogen (mg/L)						
Nitrite Nitrogen (mg/L)						
Total Organic Nitrogen (mg/L)						
Total Phosphate (mg/L)						
Specific Conductance				W		
Turbidity, Nephelometric (NTU)				W		

TABLE 2 (Continued)

SAMPLING SCHEDULE FOR ITT MARSH

City of Palo Alto

SAMPLING STATION (FIGURE A)	1-B	2-B	E-1			Matadero Creek
TYPE OF SAMPLE	Grab	Grab	Cont	Grab	C-24	4-day
Arsenic (μg/L) (3)					M	M
Cadmium (μg/L) (3)					M	M
Chromium (μg/L) (3)					M	M
Copper (μg/L) (3)					M	M
Cyanide (μg/L) (3)					M	M
Lead (μg/L) (3)					M	M
Mercury (μg/L) (3)					M	M
Nickel (μg/L) (3)					M	M
Selenium (μg/L) (3)					M	M
Silver (μg/L) (3)					M	M
Zinc (μg/L) (3)					M	M
PAHs (μg/L)					Y	
All applicable standard observations (4)				W		
Organic Priority Pollutants (μg/L)					2Y	

TYPES OF SAMPLES
C-24 = 24 hr. Composite sample
Cont. = Continuos sampling

SAMPLING FREQUENCY
D = Once each day
W = Once each week
M = Once each month
Y = Once each year
2Y = Once every two years

Footnotes:
(1) Measures should be made in the afternoon, when pH and ammonia toxicity are at their maximum.
(2) Measures should be made within an hour of dawn, when DO values are at their lowest levels.
(3) Method detection limits for marsh samples shall be no greater than those used for effluent testing.
(4) All applicable observations, including rainfall.